

Abstract Submitted
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Pinch-off Dynamics of Non-Newtonian Fluids F. M. HUISMAN, P. TABOREK, University of California Irvine — The pinch-off dynamics of a variety of shear-thinning fluids (foams, concentrated emulsions, and slurries) were studied using high speed videography. The pinch was characterized by the variation of the minimum neck radius r_{\min} as a function of the time to pinch τ . For inviscid fluids, r_{\min} scales as τ to the $2/3$ power. We found that for all the shear-thinning fluids r_{\min} scales with τ to a power in the range 0.2 to 0.5. To study the transition from conventional inviscid pinch, we systematically varied the concentration of a water-bentonite mixture. As the concentration increased the pinch event transitioned from a needle shape resulting in a satellite drop to a symmetric hyperbolic shape with no satellite drop. These results will be compared with the simulations of Suryo and Basaran (J. Non-Newtonian Fluid Mech. 138 (2006) 134-160).

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